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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ROBERT J. DEPKE LEWIS T. STEADMAN
HOLLAND & KNIGHT LLC
131 SOUTH DEARBORN
30TH FLOOR
CHICAGO, IL 60603

EXAMINER	
AHMED, SAMIR ANWAR	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/711,595	SHINOHARA, MAMORU	
	Examiner	Art Unit	
	Samir A. Ahmed	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3,21 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/22/04 has been entered.

2. Applicant's amendment filed on 11/22/04 has been entered and made of record.

3. Applicant did not amend Fig. 2 to show "the static electricity drawing wiring 401 protrudes from the fingerprint recognizing surface upwardly" as described in the specification on page 19, lines 14-18. The grounds for objection to Fig. 2 stated in paragraph 2 of the Office Action mailed on 2/17/04 paper number 10 are incorporated by reference herein.

4. Applicant's arguments filed 11/22/04 have been fully considered but they are not persuasive for the following reasons:

Applicant alleges, "the art of record fails to either teach [,] " (page 4, lines 3-6). The Examiner disagrees. Firstly, Machida discloses, the passivation film 1007 (insulating film) is formed to cover the sensor electrodes 1005 (first electrodes). The upper portions of the ground electrodes 1006 (second electrodes) are exposed on the upper surface of the passivation film 1007 (Fig. 10, col. 22, lines 64-67, col. 24, lines 60-64). One of ordinary skill in the art would recognize from the nature of the problem to be solved, i.e., maintaining the upper portions of the ground electrodes (second electrodes)

exposed on the upper surface of the passivation film (the insulating film) adjacent to the ground electrodes is only realized by either keeping the upper portions of the ground electrodes (second electrodes) at the same level of the upper surface of the passivation film (the insulating film) (i.e., same height) or keeping the upper portions of the ground electrodes (second electrodes) at a higher level than the upper surface of the passivation film (the insulating film) (i.e., the ground electrode height is larger than the passivation film height). The nature of the above problem to be solved dictates using one of those two solutions in order to discharge the finger from its charge when the finger contacts the ground electrodes 1006 which their upper portions are either kept at the same level of the upper surface of the passivation film 1007, or their upper portions are either kept at higher level of the upper surface of the passivation film 1007 which provides even better contact to the finger. Secondly, Knapp discloses a capacitive fingerprint sensor that uses sensor electrodes (14) (first electrodes) and ground electrodes (53 or 54) (second electrodes) secured to a semiconductor substrate 30, the ground electrodes (second electrodes) are deposited on the surface of the insulating film 32, in order to improve the electrical contact of the ground electrodes to the finger surface (Figs. 7a, 7b, 8), i.e., distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas et al. (U.S. Patent 6,501,142).

As to claim 21, Thomas discloses, a semiconductor apparatus, comprising:

a plurality of first capacitor electrodes secured to a substrate [Fig. 5, capacitor electrodes 10, 12 (first capacitor electrodes), substrate 13] and;

a plurality of discharge electrodes secured to said substrate and electrically separated from said first electrodes and extending above a primary level of an insulating layer formed above said first capacitor electrodes [Fig.5, discharge electrodes 32, electrically separated from electrodes 10, 12 (first electrodes), discharge electrodes 32 extending above the surface of insulation layer 16 formed above electrodes 10,12 (first electrodes)].

As to claim 22, Thomas discloses, a semiconductor apparatus, comprising:

a plurality of first capacitor electrodes secured to a substrate [Fig. 5, capacitor electrodes 10, 12 (first capacitor electrodes), substrate 13] and;

a plurality of discharge electrodes secured to said substrate and electrically separated from said first electrodes and extending above a primary level of an insulating

layer formed above said first capacitor electrodes [Fig. 5, discharge electrodes 32, electrically separated from electrodes 10, 12 (first electrodes), discharge electrodes 32 extending above the surface of insulation layer 16 formed above electrodes 10,12 (first electrodes)], and further wherein the discharge electrodes have insulation on a top surface thereof that is at a level higher than the primary level of the insulating layer formed above the capacitor electrodes [a passivation layer 34 is formed over the discharge electrodes 34 (insulation on a top surface of the discharge electrodes) (col. 7, lines 54-56, Fig. 5), as shown in Fig.5, the top of the passivation layer 34 (insulation) formed over the discharge electrode 32 is at a level higher than the level of insulation layer 16 formed above capacitor electrodes 10, 12].

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Applicant's admitted prior art (Figs. 4, 5A, 5B) and Machida et al. (6,248,655).

As to claim 3, Applicant's admitted prior art discloses a semiconductor apparatus, comprising:

a substrate having a transistor (Fig. 5A, substrate 10, Fig. 5B transistor WL1);

a plurality of first capacitor electrodes secured to said substrate (Fig 5A electrodes 21(52)); and

an insulating film formed so as to cover said first electrodes (Fig. 5A, insulation film 30(53)). Applicant's admitted prior art does not disclose, a plurality of second electrodes secured to said substrate and electrically separated from said first electrodes, the insulating film is between the first electrodes and second electrodes, wherein, the first and second electrodes have a common bottom level and the plurality of second electrodes each have a top surface which is above a top surface of the first electrodes, and wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Machida discloses a conventional capacitive fingerprint sensor (similar to that disclosed by Applicant's admitted prior art) where plurality of capacitive sensor electrodes 2406 are secured on a semiconductor substrate and covered by a passivation film 2407 of insulating material. The capacitive sensor is mounted together with an LSI (integrated circuit) chip on the substrate. However since the skin of the finger is used as an electrode, an LSI mounted on the substrate together with the sensor is susceptible to damage due to static electricity generated when the skin touches the sensor (col. 2, lines 7-67, Figs 24, 25). Machida is solving this problem exits in the conventional prior art disclosed in both Applicants admitted prior art and Machida's back ground (col. 3, lines 8-12). This is the same problem that the instant invention is solving.

Machida discloses a capacitive fingerprint sensor as shown in Figs. 10, 11F, 12A-12C comprises a substrate 1001, a plurality of capacitive sensor electrodes 1005 (claimed first capacitor electrodes) secured to the substrate, a plurality of ground electrodes 1006 (claimed second electrodes) secured to the substrate and electrically separated from sensor electrodes 1005. A passivation film 1007 is formed to cover sensor electrodes 1005 and which is between sensor electrodes 1005 and ground electrodes 1006. The passivation film 1007 is made up of an insulating material (Fig. 10, col. 22, line 47-col. 23, line 14, Fig. 11F, col.24, lines 60-67, Figs. 12A-12C, col. 25, lines 1-17). As clearly shown by Figs 10, 11F, 12A, the sensor electrodes 1005 and the ground electrodes 1006 have a common bottom level and the ground electrodes 1006 each have a top surface which is above the top surface of sensor electrode 1005. One of ordinary skill in the art would recognize that the transistor mounted on the substrate together with the sensor in Applicant's admitted prior art finger print sensor is susceptible to damage due to static electricity generated when the skin touches the sensor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use Machida's teachings to modify Applicant's admitted prior art fingerprint sensor by using ground electrodes (second electrodes) in the insulating film, the ground electrodes are separated from the sensor electrodes (first electrodes), have a common bottom level, and the ground electrodes (second electrodes) have a top surface which is above the top surface of the sensor electrodes (first electrodes) in order to when the finger touches the ground electrodes the static electricity flows to the ground electrodes. This suppresses damage to other integrated circuit portions formed

below the ground electrodes due to the static electricity (col. 24, lines 18-26) and to reliably perform stable, high sensitivity surface shape (fingerprint) detection without causing damage due to static electricity in sensing operation (col. 3, lines 8-12).

Machida further discloses, the passivation film 1007 (insulating film) is formed to cover the sensor electrodes 1005 (first electrodes). The upper portions of the ground electrodes 1006 (second electrodes) are exposed on the upper surface of the passivation film 1007 (Fig. 10, col. 22, lines 64-67, col. 24, lines 60-64). Machida does not clearly disclose, wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film. However one of ordinary skill in the art would recognize from the nature of the problem to be solved, i.e., maintaining the upper portions of the ground electrodes (second electrodes) exposed on the upper surface of the passivation film (the insulating film) adjacent to the ground electrodes is only realized by either keeping the upper portions of the ground electrodes (second electrodes) at the same level of the upper surface of the passivation film (the insulating film) (i.e., same height) or keeping the upper portions of the ground electrodes (second electrodes) at a higher level than the upper surface of the passivation film (the insulating film) (i.e., the ground electrode height is larger than the passivation film height). The nature of the above problem to be solved dictates using one of those two solutions in order to discharge the finger from its charge when the finger contacts the ground electrodes 1006 which their upper portions are either kept at the same level of the upper surface of the passivation film 1007, or their upper portions

are either kept at higher level of the upper surface of the passivation film 1007 which provides even better contact to the finger.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Applicant's admitted prior art (Figs. 4, 5A, 5B), Machida et al. (6,248,655) and Knapp (U.S. Patent 5,325,442).

As to claim 3, Applicant's admitted prior art discloses a semiconductor apparatus, comprising:

a substrate having a transistor (Fig. 5A, substrate 10, Fig. 5B transistor WL1);

a plurality of first capacitor electrodes secured to said substrate (Fig 5A electrodes 21(52)); and

an insulating film formed so as to cover said first electrodes (Fig. 5A, insulation film 30(53)). Applicant's admitted prior art does not disclose, a plurality of second electrodes secured to said substrate and electrically separated from said first electrodes, the insulating film is between the first electrodes and second electrodes, wherein, the first and second electrodes have a common bottom level and the plurality of second electrodes each have a top surface which is above a top surface of the first electrodes, and wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Machida discloses a conventional capacitive fingerprint sensor (similar to that disclosed by Applicant's admitted prior art) where plurality of capacitive sensor electrodes 2406 are secured on a semiconductor substrate and covered by a

passivation film 2407 of insulating material. The capacitive sensor is mounted together with an LSI (integrated circuit) chip on the substrate. However since the skin of the finger is used as an electrode, an LSI mounted on the substrate together with the sensor is susceptible to damage due to static electricity generated when the skin touches the sensor (col. 2, lines 7-67, Figs 24, 25). Machida is solving this problem exits in the conventional prior art disclosed in both Applicants admitted prior art and Machida's back ground (col. 3, lines 8-12). This is the same problem that the instant invention is solving.

Machida discloses a capacitive fingerprint sensor as shown in Figs. 10, 11F, 12A-12C comprises a substrate 1001, a plurality of capacitive sensor electrodes 1005 (claimed first capacitor electrodes) secured to the substrate, a plurality of ground electrodes 1006 (claimed second electrodes) secured to the substrate and electrically separated from sensor electrodes 1005. A passivation film 1007 is formed to cover sensor electrodes 1005 and which is between sensor electrodes 1005 and ground electrodes 1006. The passivation film 1007 is made up of an insulating material (Fig. 10, col. 22, line 47-col. 23, line 14, Fig. 11F, col.24, lines 60-67, Figs. 12A-12C, col. 25, lines 1-17). As clearly shown by Figs 10, 11F, 12A, the sensor electrodes 1005 and the ground electrodes 1006 have a common bottom level and the ground electrodes 1006 each have a top surface which is above the top surface of sensor electrode 1005. One of ordinary skill in the art would recognize that the transistor mounted on the substrate together with the sensor in Applicant's admitted prior art finger print sensor is susceptible to damage due to static electricity generated when the skin touches the

sensor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use Machida's teachings to modify Applicant's admitted prior art fingerprint sensor by using ground electrodes (second electrodes) in the insulating film, the ground electrodes are separated from the sensor electrodes (first electrodes), have a common bottom level, and the ground electrodes (second electrodes) have a top surface which is above the top surface of the sensor electrodes (first electrodes) in order to when the finger touches the ground electrodes the static electricity flows to the ground electrodes. This suppresses damage to other integrated circuit portions formed below the ground electrodes due to the static electricity (col. 24, lines 18-26) and to reliably perform stable, high sensitivity surface shape (fingerprint) detection without causing damage due to static electricity in sensing operation (col. 3, lines 8-12).

Neither Applicant's admitted prior art nor Machida discloses, wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Knapp discloses a capacitive fingerprint sensor that uses sensor electrodes (14) (first electrodes) and ground electrodes (53 or 54) (second electrodes) secured to a semiconductor substrate 30, the ground electrodes (second electrodes) are deposited on the surface of the insulating film 32, in order to improve the electrical contact of the ground electrodes to the finger surface (Figs. 7a, 7b, 8), i.e., distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating

film. One of ordinary skill in the art would recognize that maintaining the top surface of the ground electrodes (second electrodes) at larger height than the sensor electrodes (first electrodes) would improve the electrical contact of the ground electrodes to the finger surface and insure the discharge of the static electricity on the fingertip to protect the integrated circuits of the fingerprint senor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use Knapp's teachings to modify the combined fingerprint sensor of Applicant's admitted prior art and Machida by maintaining a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film in order to improve the electrical contact of the ground electrodes to the finger surface and insure the discharge of the static electricity on the fingertip to protect the integrated circuits of the fingerprint senor

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Applicant's admitted prior art (Figs. 4, 5A, 5B), Machida et al. (6,248,655) and Thomas et al. (U.S. Patent 6,501,142).

As to claim 3, Applicant's admitted prior art discloses a semiconductor apparatus, comprising:

a substrate having a transistor (Fig. 5A, substrate 10, Fig. 5B transistor WL1);

a plurality of first capacitor electrodes secured to said substrate (Fig 5A electrodes 21(52)); and

an insulating film formed so as to cover said first electrodes (Fig. 5A, insulation film 30(53)). Applicant's admitted prior art does not disclose, a plurality of second

electrodes secured to said substrate and electrically separated from said first electrodes, the insulating film is between the first electrodes and second electrodes, wherein, the first and second electrodes have a common bottom level and the plurality of second electrodes each have a top surface which is above a top surface of the first electrodes, and wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Machida discloses a conventional capacitive fingerprint sensor (similar to that disclosed by Applicant's admitted prior art) where plurality of capacitive sensor electrodes 2406 are secured on a semiconductor substrate and covered by a passivation film 2407 of insulating material. The capacitive sensor is mounted together with an LSI (integrated circuit) chip on the substrate. However since the skin of the finger is used as an electrode, an LSI mounted on the substrate together with the sensor is susceptible to damage due to static electricity generated when the skin touches the sensor (col. 2, lines 7-67, Figs 24, 25). Machida is solving this problem exits in the conventional prior art disclosed in both Applicants admitted prior art and Machida's back ground (col. 3, lines 8-12). This is the same problem that the instant invention is solving.

Machida discloses a capacitive fingerprint sensor as shown in Figs. 10, 11F, 12A-12C comprises a substrate 1001, a plurality of capacitive sensor electrodes 1005 (claimed first capacitor electrodes) secured to the substrate, a plurality of ground electrodes 1006 (claimed second electrodes) secured to the substrate and electrically

separated from sensor electrodes 1005. A passivation film 1007 is formed to cover sensor electrodes 1005 and which is between sensor electrodes 1005 and ground electrodes 1006. The passivation film 1007 is made up of an insulating material (Fig. 10, col. 22, line 47-col. 23, line 14, Fig. 11F, col.24, lines 60-67, Figs. 12A-12C, col. 25, lines 1-17). As clearly shown by Figs 10, 11F, 12A, the sensor electrodes 1005 and the ground electrodes 1006 have a common bottom level and the ground electrodes 1006 each have a top surface which is above the top surface of sensor electrode 1005. One of ordinary skill in the art would recognize that the transistor mounted on the substrate together with the sensor in Applicant's admitted prior art finger print sensor is susceptible to damage due to static electricity generated when the skin touches the sensor. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use Machida's teachings to modify Applicant's admitted prior art fingerprint sensor by using ground electrodes (second electrodes) in the insulating film, the ground electrodes are separated from the sensor electrodes (first electrodes), have a common bottom level, and the ground electrodes (second electrodes) have a top surface which is above the top surface of the sensor electrodes (first electrodes) in order to when the finger touches the ground electrodes the static electricity flows to the ground electrodes. This suppresses damage to other integrated circuit portions formed below the ground electrodes due to the static electricity (col. 24, lines 18-26) and to reliably perform stable, high sensitivity surface shape (fingerprint) detection without causing damage due to static electricity in sensing operation (col. 3, lines 8-12).

Neither Applicant's admitted prior art nor Machida discloses, wherein a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film.

Thomas discloses a capacitive fingerprint sensor that uses capacitive electrodes 10, 12 (first electrodes) and discharge electrodes 32 (second electrodes) secured to a semiconductor substrate 13, the discharge electrodes 32 (second electrodes) are between the capacitive electrodes 10, 12 and extends above the primary surface of the insulating film 16 formed above the capacitive electrodes 10, 12 (first electrodes), in order to improve the electrical contact of the discharge electrodes to the finger surface (Fig 5), it is clear in Fig. 5 that distance between a top surface of said substrate 13 and said top surface of the second electrodes 32 is larger than a distance between the top surface of said substrate 13 and the top surface of said insulating film 16. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use Thomas's teachings to modify the combined fingerprint sensor of Applicant's admitted prior art and Machida by maintaining a distance between a top surface of said substrate and said top surface of the second electrodes is larger than a distance between the top surface of said substrate and the top surface of said insulating film in order to improve the electrical contact of the discharge electrodes to the finger surface and insure the discharge of the static electricity on the fingertip to protect the integrated circuits of the fingerprint senor (col.3, lines 39-44).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir A. Ahmed whose telephone number is 703-305-9870. The examiner can normally be reached on Mon-Fri 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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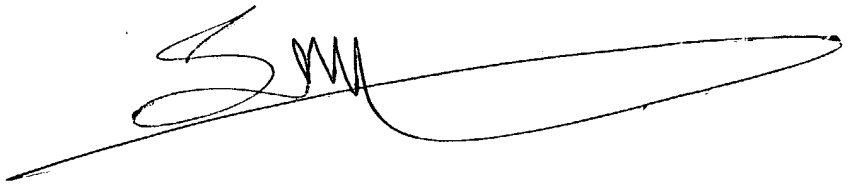

SAMIR AHMED
PRIMARY EXAMINER